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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,326	07/06/2006	Harue Nakashima	0756-7732	9757

31780 7590 09/21/2010

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EXAMINER	
BOHATY, ANDREW K	

ART UNIT	PAPER NUMBER
1786	

MAIL DATE	DELIVERY MODE
09/21/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,326	NAKASHIMA ET AL.	
	Examiner	Art Unit	
	Andrew K. Bohaty	1786	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 August 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10,11,29-33 and 49-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10,11,29-33 and 49-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2010/08/23*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action is in response to the amendment filed August 23, 2010, which amends claims 10, 11, 29-33, and 49-53 and cancels claims 54. Claims 10, 11, 29-33, and 49-53 are pending.

Response to Amendment

2. The applicant's amendment of the claims, filed August 23, 2010, has caused the withdrawal of the rejection of claims 49 and 52 under 35 U.S.C. 112, first paragraph, as set forth in the Office action mailed May 25, 2010.

3. The applicant's amendment of the claims and cancellation of the claims, filed August 23, 2010, has caused the withdrawal of the rejection of claims 10, 11, 29-33, and 49-54 under 35 U.S.C. 112, second paragraph, as set forth in the Office action mailed May 25, 2010.

4. The applicant's amendment of the claims and cancellation of the claims, filed August 23, 2010, has caused the withdrawal of the rejection of claims 10, 11, 29, 30, 32, 33, 50, 51, 53, and 54 under 35 U.S.C. 103(a) as being unpatentable over Onikubo et al. (US 2004/0151944) in view of Hosokawa (US 6,660,410) and Thompson et al. (US 2003/0175553) as set forth in the Office action mailed May 25, 2010.

5. The applicant's amendment of the claims and cancellation of the claims, filed August 23, 2010, has caused the withdrawal of the rejection of claim 31 under 35 U.S.C. 103(a) as being unpatentable over Onikubo et al. (US 2004/0151944) in view of

Hosokawa (US 6,660,410), Thompson et al. (US 2003/0175553) and Lee et al. (US 2001/0046612) as set forth in the Office action mailed May 25, 2010.

6. The applicant's amendment of the claims, filed August 23, 2010, has caused the withdrawal of the rejection of claims 10, 11, and 49 under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 5,756,248) as set forth in the Office action mailed May 25, 2010.

7. The applicant's amendment of the claims and cancellation of the claims, filed August 23, 2010, has caused the withdrawal of the rejection of claims 10, 11, 29-33, and 50-54 under 35 U.S.C. 103(a) as being unpatentable Liu et al. (Synthetic Metals 2004, 146, 85-89) in view of Hosokawa (US 6,660,410) and Thompson et al. (US 2003/0175553) as set forth in the Office action mailed May 25, 2010.

Response to Arguments

8. Applicant's arguments with respect to claims 10, 11, 29-33, and 49-53 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claim 49 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

11. In claim 49, the applicant claims "wherein the aryl group having 6 to 12 carbon atoms is selected from a phenyl group, a 4-phenylyl group, a 1-naphthyl group, a 2-naphthyl group, a 9-anthryl group, a 9-phenyantryl group, a 1-pyrenyl group, a 9,9'-dimethyl-2-fluorenyl group, a spiro-9,9'-bifluorene-2-yl group, a m-tolyl group, a p-tolyl group, a 2-fluorophenyl group, a 3-fluorophenyl group, a 4-fluorophenyl group", but applicant in the specification does not disclose these compounds aryl groups having 6 to 12 carbon atoms. The applicant discloses these compounds as aryl groups having 6 to 25 carbon atoms (see paragraph [0053] of the specification).

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims 10, 11, 32, and 49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

14. Regarding claims 10 and 49, the applicant claims Ar^{11} represents an aryl group having 6 to 12 carbon atoms or a heteroaryl group having 5 to 9 carbon atoms and then further claims the aryl group having 6 to 12 carbon atoms is selected from a phenyl group, a 4-phenylyl group, a 1-naphthyl group, a 2-naphthyl group, a 9-anthryl group, a 9-phenyantryl group, a 1-pyrenyl group, a 9,9'-dimethyl-2-fluorenyl group, a spiro-9,9'-

bifluorene-2-yl group, a m-tolyl group, a p-tolyl group, a 2-fluorophenyl group, a 3-fluorophenyl group, a 4-fluorophenyl group. It is unclear what the applicant interprets a aryl group having 6 to 12 carbon atoms and if the group can be further substituted and these substituents can form fused rings. The examiner will interpret the aryl group having 6 to 12 carbon atoms can have substituents and the substituents can form fused rings and the carbon atoms in the substituents does not count towards to 6 to 12 carbon atoms in the aryl group.

15. Claims 10 and 11 are rejected due to their dependence on claim 10.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

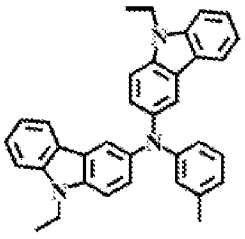
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

18. Claims 10, 11, 29-33, and 49-53 are rejected under 35 U.S.C. 103(a) as being unpatentable Liu et al. (Synthetic Metals 2004, 146, 85-89) (hereafter “Liu”) in view of

Hosokawa (US 6,660,410) (hereafter “Hosokawa”) and Thomson et al. (US 6,242,115) (hereafter "Thomson").

19. Regarding claims 10, 11, 29-33, and 49-53, Liu teaches a carbazole compound with the following structure,  , (DECMA, page 86 right column), which reads on applicant’s formula (1), where R^{12} and R^{14} are hydrogen and Ar^{11} is m-tolyl. Liu teaches that these carbazoles can be used in light emitting elements and can be found in either the hole injection layer, which is in contact with the anode and is between the anode and the light emitting layer, or in the light emitting layer and emits blue light (page 87 right column first paragraph under heading 3.2 Optical properties of DECMA and page 88 Fig. 4 (A), left column all paragraphs under heading 3.3 EL performances of DECMA-based OLEDs). Liu teaches the light emitting elements can be used in display devices and the display device inherently emits lights, which makes it a light system (page 85 left column first paragraph under heading introduction).

20. Liu does not teach where the N positions of the carbazole group contains aryl groups having 6 to 25 carbon atoms and where the aryl groups are different.

21. Hosokawa teaches carbazole derivatives that can be used for light emitting devices wherein the N position of the carbazole contains an aryl group and teaches phenyl, naphthyl, anthranyl, phenanthryl, pyrenyl, biphenyl, and triphenyl as some of the preferred aryl groups (column 2 lines 56-67, column 3 lines 1-29, and column 7 lines 39-

45, compounds (7)-(24)). Hosokawa teaches that changing the substituent attached to the carbazole group changes the glass transition of the material and that the glass transition should be between 110 °C and 170 °C (column 6 lines 33-51). Hosokawa teaches that materials having a glass transition higher than 110 °C have a practical life span and a superior heat-resistance (column 29 lines 46-54). Hosokawa further teaches the carbazole compounds can be used as host materials for phosphorescent dopants in light emitting device (column 1 lines 14-67 and column 2 lines 1-33). Hosokawa teaches the by using the carbazole compounds has host material the luminescence efficiency of the light emitting device can be increased (column 2 lines 10-20).

22. Thomson teaches carbazole derivatives that can be used for light emitting devices (column 4 lines 51-61 and Table 1). Thomson teaches that the charge carrier materials, carbazole compounds, are made asymmetric (column 4 lines 56-61). Thomson teaches that making charge carrier compounds, such as carbazoles, asymmetric increases the glass transition temperature of the compounds and improves (column 4 lines 51-61).

23. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the carbazole derivative of Liu so the N positions of the carbazoles contained an aryl group having 6 to 25 carbon atoms, such as phenyl, naphthyl, anthranyl, phenanthryl, pyrenyl, biphenyl, or triphenyl, and where each aryl group attached to each carbazole group was different, and use the carbazole compounds as a host material for a phosphorescent as in the light emitting layer of the

light emitting device. The motivation would have been to increase the glass transition temperature of the material and therefore increasing the stability of the material. The motivation to make the aryl groups different would have been to make to the compound asymmetric. The motivation to use the compound as a host material would have been to increase the luminescence efficiency of the light emitting device.

Conclusion

24. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

25. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew K. Bohaty whose telephone number is

(571)270-1148. The examiner can normally be reached on Monday through Thursday 7:30 am to 5:00 pm EST and every other Friday from 7:30 am to 4 pm EST.

27. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on (571)272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

28. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. K. B./
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Patent Examiner, Art Unit 1786

/D. Lawrence Tarazano/
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